



Systematic Evidence Reviews

Improving Their Use for Policy Makers

David Atkins, MD, MPH

Center for Outcomes and Evidence

Agency for Healthcare Research and Quality

Policy Questions

- Drug approval -- Focus of other activities
- Coverage
 - Should insurers cover bariatric surgery?
- Clinical Practice Guidelines
 - Should annual Pap tests be recommended for all women?
- Health System Policies
 - Should a hospital adopt medication bar coding?
- Quality Measurement
 - Should annual retinal exams be a quality measure for diabetic care?

Coverage Questions

- Should cardiac resynchronization therapy be covered?
- Should a tiered benefits plan charge higher co-pays for brand-name PPIs?
- Should carotid artery surgery only be reimbursed at “centers of excellence”?
- Should prior approval be required for new biologics for rheumatoid arthritis?

What Policy Makers Need To Know

- *Can it work?*
- *Will it work?*
 - When will it work?
 - For which patients, under what conditions
- *Is it worth it?*

Brian Haynes

ACP Journal Club

Why Do We Need Systematic Reviews?

- Few trials address all the questions that need to be answered
- Policy issues often involve integrating complex data to answer multiple questions
- Variable quality of published literature
 - Even well done trials have limitations
- Bias and conflicts of interest are common
 - need methods to protect against them

Features of Systematic Reviews

- Explicit methods, avoid bias
- Clearly specified questions
- Systematic search for relevant studies
- Consistent evaluation of quality of individual studies
- Conclusions reflect quality of individual studies, strength of aggregate evidence

Distinguish what we know from what we don't
Facilitate decision making

Different Types of Systematic Reviews

- Meta-analysis of RCTs
 - Multiple RCTs of similar intervention (drugs)
- Review of RCTs and non-randomized studies
 - Explore subgroups not examined in RCTs
- Review of non-randomized studies only
 - More common in studies of new technologies and procedures

Misconception about Systematic Reviews

- Strength depends on number of studies examined
- Requires elaborate methods for assessing individual studies
- Most useful when large number of RCTs
- Relies on quantitative synthesis

What Systematic Reviews Can Add

- More precise estimate of benefits
 - Examine subgroup effects
- Identify less common outcomes
 - Harms
- Explore and explain inconsistent results
- Carefully examine strengths and weakness of lower quality evidence
- Synthesize evidence on benefits and harms

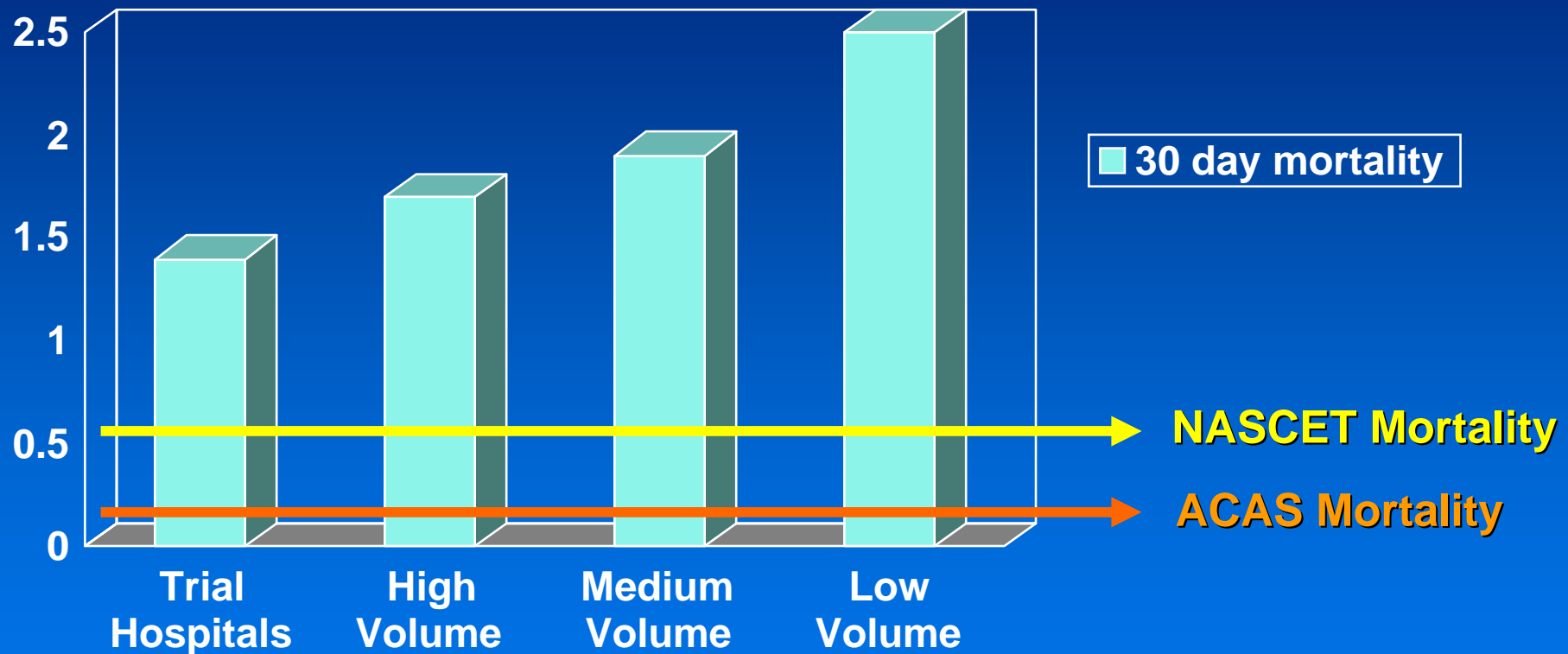
Types of Questions and Reviews: *Can It Work?*

- Efficacy studies with high internal validity
 - Meta-analysis may provide more precise estimate of effect
- Compelling and consistent findings from non-randomized studies
 - e.g. bariatric surgery, total knee replacement

Types of Questions and Reviews: *Will It Work and For Whom?*

- Effectiveness studies
- Explore consistency among trials in different settings and populations
- Comparing trial results to more representative populations and settings
- Subgroup analysis in trials and observational studies

30 Day Mortality in Medicare Patients Undergoing Endarterectomy (by annual volume of procedures)



Wennberg et al. JAMA 1998;279:1278

Types of Questions and Reviews: *Is It Worth It?*

- Estimates of benefits and harms for specific patients groups
- Integrate RCT and observational evidence
- Modeling
- Cost-effectiveness studies

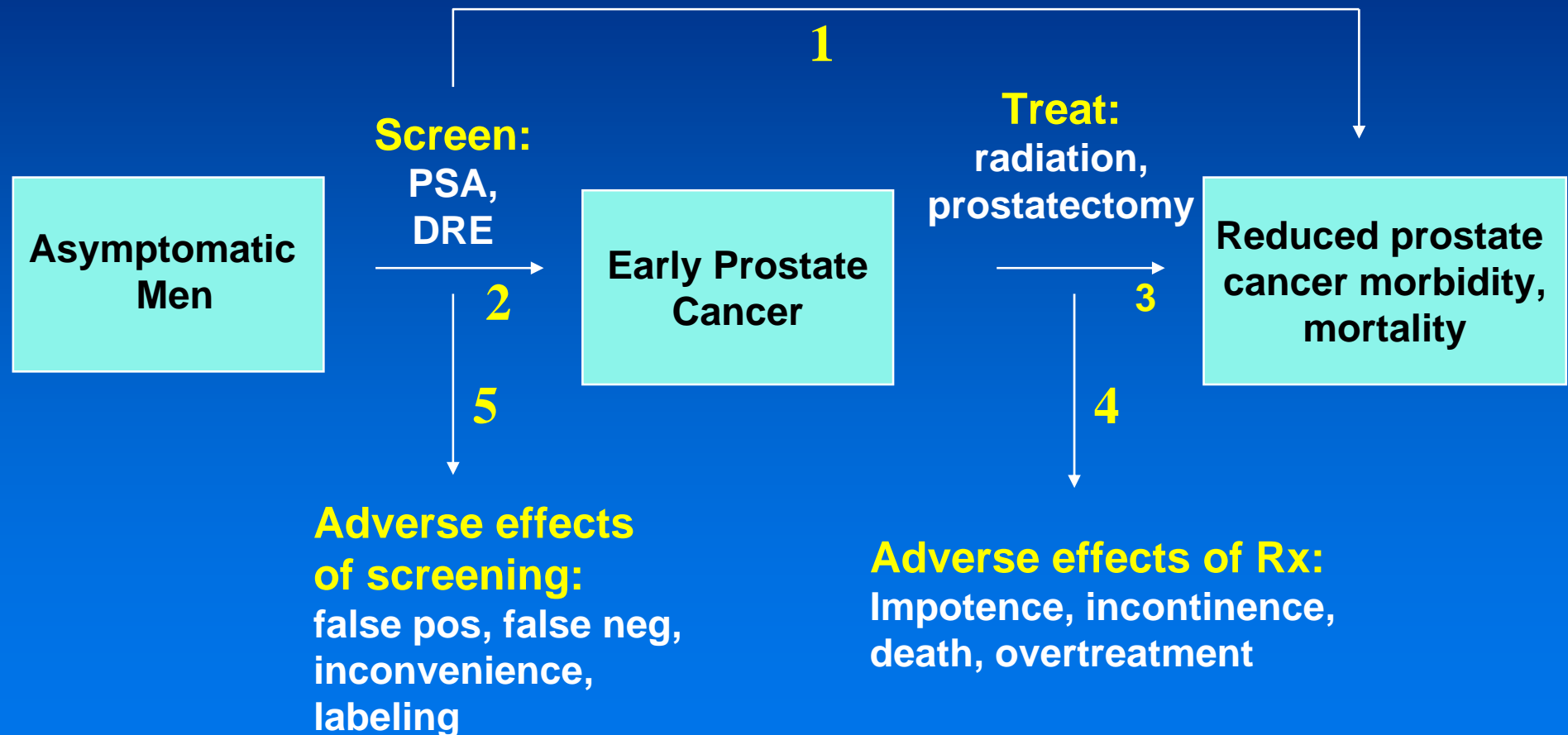
5- year benefits and harms of tamoxifen in 1000 45 year old women

	- FHx	+FHx
5-year risk	0.7%	1.6%
Invasive breast CA	3-4 avoided	8 avoided
Non-invasive breast CA	1-2 avoided	2-3 avoided
Hip fracture	<1 avoided	<1 avoided
Endometrial CA	1-2 caused	1-2 caused
Stroke, PE, DVT	3-5 caused	3-5 caused

Types of Questions and Reviews: *What Do We Need To Know?*

- Define which intermediate and clinical outcomes are known
- Define gaps in critical evidence

What Do We Definitely Know About Prostate Cancer Screening?



Limitations of Systematic Reviews

- Evidence addressing specific clinical questions may be limited
 - E.g., what should first-line therapy be?
- Emphasis on *average* effect may not apply to individual patients
 - Heterogeneity of treatment effect
- Approach shaped by question being examined
 - How far to look at lower-quality studies?
- Occasional conflict between reviews
 - USPSTF and Cochrane reviews on mammography

Steps to Improve Value of Systematic Reviews

- Understand explicit policy questions prior to review process
- Trial registration
- Collaborations to pool individual patient data
 - Standardization of outcome measures
- Integrate data from RCT and non-randomized studies
- Study sources of bias in non-randomized studies
- Put reviews in context of previous reviews

Relationship of Evidence to Evidence-based Health Policy



From Muir Gray – *Evidence-based Health Care*

Systematic Reviews - Conclusions

- Provide consistent and transparent approach
 - define limits of what we know and don't know
- Useful for decision making
- Unlikely to answer all the questions that might inform specific policy questions
- Essential for identifying research gaps
- Will not eliminate controversy over evidence or resolve policy debates